REMARKS/ARGUMENTS

This Office Action is in response to an Election filed 5/12/2005. Currently, claims 1-20 are pending. Claims 1-9 are withdrawn from consideration.

Election/Restrictions

1. Applicant's election without traverse of claims 10-20 in the reply filed on 5/12/2005 is acknowledged.

2. Claims 1-9 have been withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected device, there being no allowable generic or linking claim. Election was made without traverse in the reply filed on 5/12/2005.

Claims 1-9 are canceled herewith.

Substantive Grounds of Rejection

6. Claims 10, 15-16 and 18-19 are rejected under 35 U.S.C. I 03(a) as being unpatentable over Yu (U.S. Patent No. 6,297,115, dated 10/2/2001) in view of Yu (U.S. Patent No. 6,194,748, dated 2/27/2001).

Yu (115) shows the method substantially as claimed in Figs. 5-7 and corresponding text as: depositing a dielectric material (32) (col. 4, lines 20-29); etching the dielectric material to form a spacer (32)(col. 4, lines 20-29); and depositing a thin layer (52) over the dielectric material (col. 5, line 62-col. 6, line 13) (claim 10). Yu (115) teaches that the thin layer comprises oxide (col. 5, line 62-col. 6, line 13) (claim 19).

Yu (115) shows the method substantially as claimed and as described in the preceding paragraph.

Additionally, Yu teaches: the spacer, further comprising depositing a thin layer on the spacer to prevent moisture absorption (oxide layers formed over structures are use to prevent moisture absorption)(col. 5, line 62-col. 6, line 1 3) (claim 18).

Yu (115) lacks anticipation only in not explicitly teaching that: 1) forming pores in the dielectric material; and depositing a thin layer over the porous dielectric material (claim 10); 2) the spacer comprise a Si-O-C-N type of low-k material (claim 13); 3) the spacer has a reduced dielectric constant (k) (claim 15); 4) the reduced dielectric constant (k) is less than 3.85 (claim 16); and 5) the spacer is porous, and further comprising depositing a thin layer on the spacer to prevent moisture absorption (claim 18).

Yu (748) shows a MOSFET with porous sidewall spacers. Yu shows a spacer (38) that is formed of a porous material with a dielectric constant less than 3.0 but greater than 2.0 (xerogels or aerogels) (col. 4, lines 44-62). This structure aids in eliminating gate-edge fringing field effect, which can adversely affect the ability of the gate conductor to couple to the channel and to the source/drain extensions and also degrade the control of charges in the channel by the gate stack, thereby degrading sub-threshold characteristics of the transistor (col. 2, lines 15-32).

It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to modify the method shown in Yu (115), forming the spacers of a porous dielectric material, with a dielectric constant (k) is less than 3.85, as taught by Yu (748), with the motivation that Yu teaches the elimination gate-edge fringing field effect, which can adversely affect the ability of the gate conductor to couple to the channel and to the source/drain extensions and also degrade the control of charges in the channel by the gate stack, thereby degrading sub-threshold characteristics of the transistor.

7. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yu (U.S. Patent No. 6,297,115, dated 10/2/2001) in view of Yu (U.S. Patent No. 6,194,748, dated 2/27/2001) as

applied to claim 10 above, and further in view of Mandelman et al. (U.S. Patent No. 6,429,477 dated 8/6/2002).

Yu (115) as modified by Yu (748) shows the method substantially as claimed and as described in the preceding paragraph.

Yu (115) as modified by Yu (748) lacks anticipation only in not explicitly teaching that: 1) the thin Layer has a thickness of less than 5 nm (claim 20).

Mandelman shows a transistor device that incorporates thin layers. Thin layer (230) is formed over sidewall spacer (228) (col. 5, lines 24-32); the thin silicon oxide layer is formed between the thicknesses of 2nm-5nm (col. 5, lines 42-54). This allows the transistor to be formed with self-aligned body contact this minimizes tolerances need while minimizing process complexity.

It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to modify the method shown in Yu (115) as modified by Yu (748), by forming the thin layer with a thickness of less than 5 nm, as taught by Mandelman, with the motivation that Mandelman teaches that the thin layer allows the transistor to be formed with self-aligned body contact this minimizes tolerances need while minimizing process complexity.

Traversing the Rejection

'115 (Yu) The examiner rejects the claims to a moisture barrier based on Yu (col 5 line 62 - col 6, line 13). Although Yu does deposit an oxide layer over his spacer material, it is not used as a moisture barrier. This is evident in col. 6, lines 30-32, when this film is subsequently removed.

In contrast with Yu, in the inventive method this material is not removed. In other words, the final structure as claimed herein includes this barrier layer, whereas Yu's would not. Also, the

thickness of the layer in the present invention is thinner than that considered by Yu. See claim 20 (less than **5 nm**) vs. **10 nm** in Yu (col 5, line 64).

Allowable Subject Matter

8. **Claims 11, 12, 14 and 17** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim 11, objected to, is rewritten in independent form.
Claim 12, objected to, is rewritten in independent form.
Claim 14, objected to, is rewritten in independent form.
Claim 17, objected to, is rewritten in independent form.

Newly-presented claim 21 is similar to pending claim 13, and depends from claim 11.
Newly-presented claim 22 is similar to pending claim 13, and depends from claim 12.
Newly-presented claim 23 is similar to pending claim 13, and depends from claim 14.

Newly-presented claim 24 is similar to pending claim 16, and depends from claim 11.
Newly-presented claim 25 is similar to pending claim 16, and depends from claim 12.
Newly-presented claim 26 is similar to pending claim 16, and depends from claim 14.

Newly-presented claim 27 is similar to pending claim 19, and depends from claim 11.
Newly-presented claim 28 is similar to pending claim 19, and depends from claim 12.
Newly-presented claim 29 is similar to pending claim 19, and depends from claim 14.

Claims 27-29 cover a broader range of materials than 19, and are supported by the specification at Page 15, second paragraph.

> FIG. 4 illustrates a next step ("deposition") in the process. After spacer etch, a thin layer of material 120 is deposited to cover the porous film 112, 114. The material 120

is suitably oxide. The deposition process is suitably PECVD. The thin oxide layer 120 suitably has a thickness of less than 5 nm, such as approximately 1 to 2 nm. Any material 120 which can act as a moisture barrier may be used to seal the porous film 112, 114. This would include materials such as amorphous silicon or nitride.

The claim count now stands at 20 total, 5 independent (10, 11, 12, 14, 17).
Resulting in 0 excess total, 2 excess independent claims.
A fee is required.

9. The following is a statement of reasons for the indication of allowable subject matter: the prior art, either singly or in combination fails to anticipate or render obvious, the limitations of:

.... wherein the spacer is made porous by exposing the spacers to an oxygen plasma, as required by **claim 11**, as it depends from claim 10;

. . .. wherein the spacer comprises organic material; and

the spacer is made porous by removing the organic material, as required by **claim 12**, as it depends from claim 10;

..... wherein the pores are formed during the spacer etch, rather than during deposition of the dielectric material, as required by **claim 14**, as it depends from claim 10; and

. . . wherein the reduced dielectric constant (k) is less than 7.0, but greater than 3.85, as required by **claim 17**, as it depends from claim 10.

Conclusion

Applicant respectfully requests that a timely Notice of Allowance be issued in this case.

Respectfully submitted,

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I hereby certify that this correspondence is being transmitted to the United States Patent and Trademark Office (Fax No. 571-273-8300) on September 7, 2005.

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